Wetland Mitigation Monitoring Report for the FAP 42 (IL 13/127) site near Pyatts, Perry County, Illinois (Second monitoring year--2003)

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Summary

Based on observations made during the 2003 growing season (second year of monitoring), the following is a summary that relates the likelihood that the compensation site will meet each goal within the five-year monitoring period. The goals, objectives, and performance standards follow those outlined in the IDOT monitoring request (15 April 2002).

Overall Project goal: To create and restore 9.5 acres of wetland (including forested wetland, pond, sedge meadow, and wet prairie areas), and preserve and enhance 5.5 acres of existing floodplain forest. (Note: ISGS measurements put the size of the entire site at 6.7 ha (16.4 acres) instead of 15 acres as noted in the IDOT monitoring request.)

Hydrophytic vegetation, hydric soils, and wetland hydrology are currently present on much of the area designated "restored forested wetland." Only a small part of the area designated "shallow emergent pond" meets wetland criteria, because the pond berm was not constructed. The "sedge meadow" and "wet mesic prairie" areas lack dominant hydrophytic vegetation, hydric soils, and wetland hydrology, and are unlikely to develop these under current conditions.

Vegetation that colonized the "restored forested wetland" site is dominated by native, aggressive species. Most of the planted pecan and sweetgum saplings survived and appear to be doing well, but planted oaks did not fare as well. The performance standard of 80% survival of planted trees is not met; more trees will need to be planted to maintain compliance. Fewer shrubs were observed than expected, but those observed appear healthy and capable of persisting and spreading.

The prairie seeding appears well established, but fescue is also predominant, and should be controlled to allow native species to dominate. Results of seeding or planting in the "pond" or "sedge meadow" areas, other than the ubiquitous redtop, were not observed. The berm for the pond was not constructed, so the development of the "pond" and "sedge meadow" communities as wetlands will be limited.

Introduction

This report describes the second year of monitoring of wetlands created, restored, and preserved to mitigate for wetlands affected by the resurfacing and partial realignment of FAP 42 (IL 13/127) between Murphysboro and Pinckneyville in 2001.

Wetland delineations were previously conducted on a pre-existing floodplain forest within the mitigation site (Tessene and Brooks 1991; Wilm *et al.* 2002). Results of those surveys will be discussed.

Figure 1 includes a map showing the proposed plant community types for the site. The site plan did not state whether earthwork would be done to achieve site goals, other than an inclusion of a berm to create a shallow pond, as shown on the site map. Proposed plant communities for the site included: 1) wet mesic prairie, 2) a shallow pond, 3) a sedge meadow, 4) a floodplain forest restoration ("restored forested wetland") and 5) preservation of existing floodplain forest. The restoration/creation areas were to be planted with seeds, with rootstocks at the pond, and plantings of saplings and shrubs in the "restored forested wetland" area.

Preparation of the site was completed at least a year before the current survey, for perennial vegetation was well established on the intended creation/restoration area. Of special note was the seeding of prairie grasses and forbs on part of the site; their abundance would suggest that more than a year had gone by since planting.

Goals, Objectives, and Performance Criteria

In the request to monitor the site (Scott Marlow, IDOT, 15 April 2002), the only explicitly stated goal was that 80% of planted trees should survive to the end of the five-year monitoring period. But the materials describing the site included a site plan map and lists of species that were proposed for planting on the site (Table 1); thus, an additional goal would be that the vegetation of the site and site conditions would approach the plan. The most important of these is that areas designated as "wetland" should, in fact, meet the three wetland criteria. Also, the created plant communities should not be dominated by non-native species.

Project Goal 1: Each of the created wetland plant communities should be jurisdictional wetlands as defined by current federal standards.

Objective: The created wetland areas will be formed in a 9.5-acre former crop field.

Performance criteria:
a. Predominance of hydrophytic vegetation: More than 50% of the dominant plant species must be hydrophytic.
b. Presence of hydric soils: Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at the site.
c. Presence of wetland hydrology: The area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft), or be saturated to the surface, for at least 12.5% of the growing season.

Project Goal 2: The created wetland plant communities should meet standards for floristic composition and vegetation cover.

Objectives: A floodplain forest will be created by planting native woody species. A wet-mesic prairie will be established through seeding. A pond and sedge meadow will be established through seeding and planting rootstocks. Herbaceous vegetation will be allowed to colonize the site naturally as well.

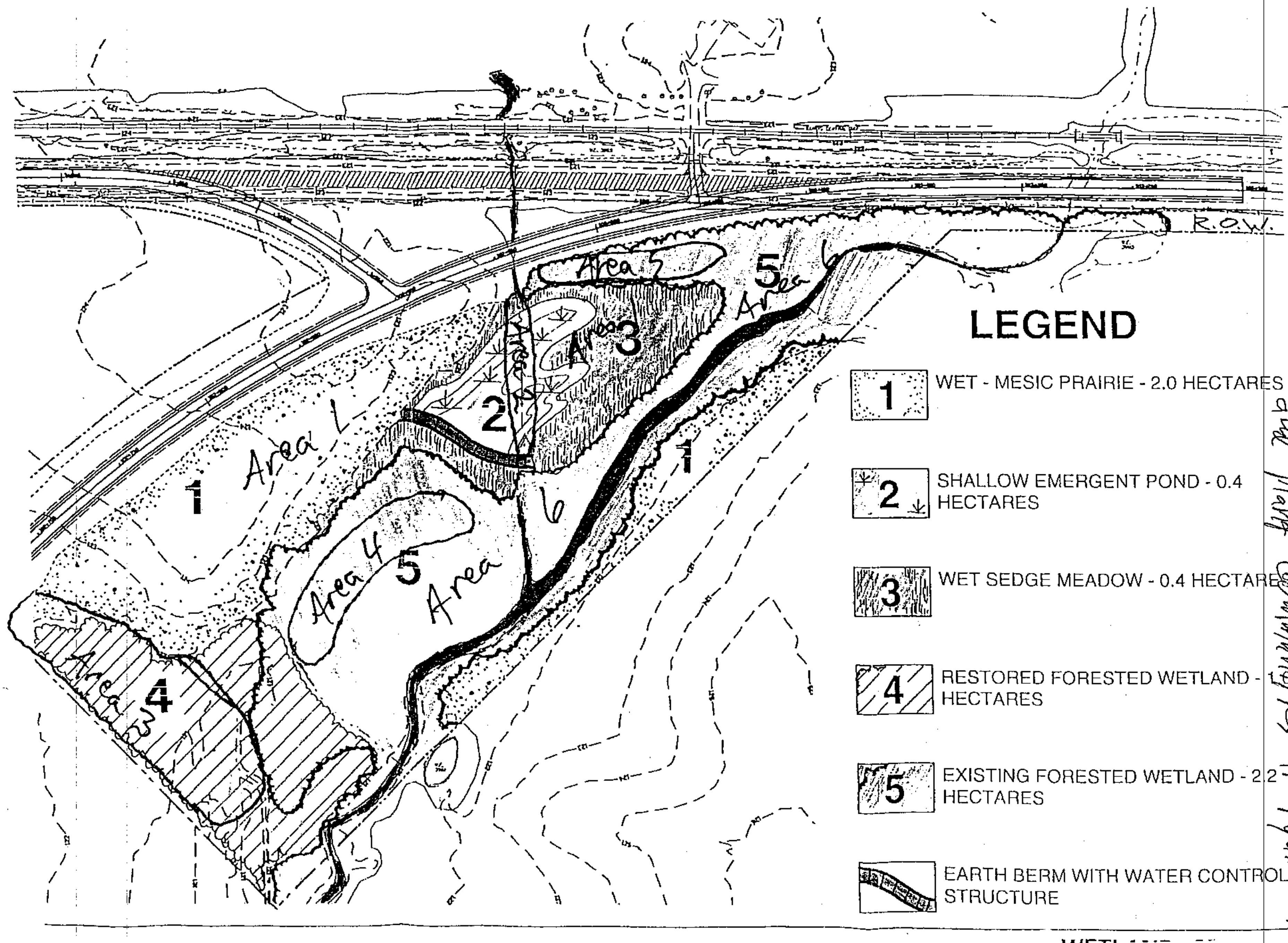

Figure 1. Location of wetland determination sites and plant communities at Pyatts Site.

Performance criteria:

a. Planted species survivorship: At the end of the five-year monitoring period, at least 80% of planted trees will be present and healthy in the created wetland site.

b. Dominant plant species: None of the three most dominant plant species in the planned wetland plant communities should be non-native species.

Table 1. Lists of species proposed for each planting area on the site.

Area 1—wet –mesic prairie (seed mixture)	Area 2—shallow pond (rootstocks)
Agrostis alba	*Acorus calamus*
Andropogon gerardii	*Pontedaria cordata*
Panicum virgatum	*Sagittaria latifolia*
Sorghastrum nutans	*Saururus cernuus*
Aster novae-angliae	
Liatris pycnostachya	
Ratibida pinnata	
Rudbeckia hirta	

Area 3—sedge meadow (seed mixture)	Area 4—restored floodplain forest (seeded grasses and planted shrubs and trees)
Agrostis alba	*Agrostis alba*
Calamagrostis canadensis	*Ilex decidua*
Carex grayi	*Itea virginica*
Carex lacustris	*Lindera benzoin*
Elymus canadensis	*Carya illinoensis*
Iris shrevei	*Liquidambar styraciflua*
Juncus effusus	*Quercus bicolor*
Lobelia cardinalis	*Quercus palustris*
Scirpus validus	*Quercus shumardii*

Methods

Project Goal 1

a) Predominance of hydrophytic vegetation.

The method for determining dominant hydrophytic vegetation at a wetland site is described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987), based on areal coverage estimates for individual plant species. Each of the dominant plant species is assigned its wetland indicator rating (Reed 1988). A plant species that is rated facultative or wetter (FAC, FAC+, FACW, or OBL) is considered to be hydrophytic. If more than 50% of the dominant species present are hydrophytic, this criterion of wetlands is met. Separate wetland determinations were done for each of the plant communities, and for wetland and non-wetland areas within the existing floodplain forest. (See Goal 2b below.)

b) Occurrence of hydric soils

To monitor hydric soil development, the soil was sampled. Soil profile morphology, including horizon color, texture, and structure was analyzed at representative points in each plant community on the site. Additionally, the presence, type, size, and abundance of redoximorphic features were recorded. In the absence of hydric soil indicators, hydrologic data can be used to confirm that conditions favorable for hydric soil formation persist at the site (Environmental Laboratory 1987).

c) Presence of wetland hydrology

Indicators of wetland hydrology include, but are not limited to, drift lines, wetland drainage patterns, sediment deposits on leaves, watermarks on trees, and visual observation of inundated or saturated soils (Environmental Laboratory 1987). Personnel from the Illinois State Geological Survey (ISGS) installed stage gages and monitoring wells in order to monitor the hydrology of the site. Monitoring well data from the ISGS in 2002 (Pociask and Lake 2002) were incomplete, but were sufficient in 2003 to estimate acreage that met the wetland hydrology criterion (Pociask and Lake 2003).

Project Goal 2

a) Planted species survivorship

The mitigation plan for the site states that 25 individuals of five tree species (*Carya illinoensis, Liquidambar styraciflua, Quercus bicolor, Q. palustris,* and *Q. shumardii*) would be planted, and that 80% of the trees should survive for the five years of monitoring. Thus the trees were identified to species and enumerated. *Quercus palustris* and *Q. shumardii* are similar species that are most easily distinguished by their acorns, so their numbers were lumped. Planted shrub species (*Ilex decidua, Itea virginica,* and *Lindera benzoin*), proposed for planting at the rate of 100 each, were also counted.

b) Dominant plant species

A complete vegetation survey of the entire wetland creation/restoration site was conducted. Separate species lists for each vegetation area were composed, and for wetland and non-wetland areas within the pre-existing forested area. However, most of the area proposed as pond and sedge meadow did not appear different than the prairie area and were lumped with that. Dominant species for each vegetation area were those that appeared to have the greatest abundance or cover.

Included with the assessment of a site is the site's Floristic Quality Index, as described by Swink and Wilhelm (1994) and Taft *et al.* (1997). Although the Index is not a substitute for quantitative vegetation analysis in assessing plant communities, it provides a measure of the floristic integrity or level of disturbance of a site. Each plant species native to Illinois is assigned a rating between 0 and 10 (the Coefficient of Conservatism) that is a subjective indicator of how likely a plant may be found on an undisturbed site in a natural plant community. A plant species that has a low Coefficient of Conservatism (c) tends to be common and is likely to tolerate disturbed conditions; a species with a high c is relatively rare and is likely to require specific, undisturbed habitats. Species that are not native to Illinois are not rated.

To calculate the Floristic Quality Index (FQI), first compute the mean c value ($\bar{c}$), $\bar{c} = (\Sigma C)/N$, where ΣC represents the sum of the numerical ratings (c) for all species native to Illinois recorded for a site, and N represents the number of native species on the site. The c value for each species is shown in the species list for the site. The FQI of each site is determined by multiplying the mean c value by the square root of N ($\bar{c}\ \sqrt{N}$)(equivalent to $\Sigma C/\sqrt{N}$). An Index score below 10 suggests a site of low natural quality; below 5, a highly disturbed site. An FQI value of at least 20 ($\bar{c}$ above 3.0) suggests that a site has evidence of native character and may be considered an environmental asset.

Results and discussion

Project goal 1

a) Predominance of hydrophytic vegetation

Dominant plant species for each of the vegetation areas are listed in Table 2 below. Full lists of plant species observed are presented in the wetland determination forms at the end of this report (Appendix 1).

Table 2. Dominant plant species by stratum and wetland indicator status.

Area 1: prairie planting Dominant Plant Species	Indicator Status	Stratum
1. *Festuca pratensis*	FACU-	herb
2. *Ratibida pinnata*	UPL	herb
3. *Sorghastrum nutans*	FACU+	herb

Area 2: marsh in drainageway at "pond" location Dominant Plant Species	Indicator Status	Stratum
1. *Juncus effusus*	OBL	herb
2. *Leersia oryzoides*	OBL	herb
3. *Scirpus atrovirens*	OBL	herb
4. *Typha angustifolia*	OBL	herb

Area 3: wet meadow understory in the open tree planting area "floodplain forest restoration" Dominant Plant Species	Indicator Status	Stratum
1. *Agrostis alba*	FACW	herb
2. *Boltonia asteroides*	FACW	herb

Area 4: low area in existing floodplain forest Dominant Plant Species	Indicator Status	Stratum
1. *Quercus palustris*	FACW	tree
2. *Ulmus americana*	FACW-	tree
3. *Cinna arundinacea*	FACW	herb
4. *Elymus virginicus*	FACW-	herb

Area 5: another low area in existing floodplain forest, near highway Dominant Plant Species	Indicator Status	Stratum
1. *Acer saccharinum*	FACW	tree
2. *Platanus occidentalis*	FACW	tree
3. *Aster lateriflorus*	FACW-	herb

Area 6: majority of existing floodplain forest Dominant Plant Species	Indicator Status	Stratum
1. *Fraxinus pennsylvanica*	FACW	tree
2. *Ulmus americana*	FACW-	tree
3. *Lonicera japonica*	FACU	woody vine
4. *Viola pratincola*	FAC	herb

For all the sites other than the prairie planting, hydrophytic vegetation predominates. The predominance of fescue in the prairie planting is also a potential problem for the development of vegetation on that site.

b) Presence of hydric soils

Soils mapped at the site include an Aquertic Hapludalf which is somewhat poorly drained (Hoyleton series) and a Typic Fluvaquent which is poorly drained (Bonnie series)(Grantham and Idorante 1988). Soils on different parts of the site were most similar to the Hoyleton series (the prairie planting), the Bonnie series (low areas in the floodplain forest and restored floodplain forest, and along the "pond" drainageway). Soils similar to the somewhat poorly drained Belknap series (Fluvaquentic Endoaquept) are present on parts of the existing floodplain forest. Soils in the Bonnie and Belknap series are commonly found in the Beaucoup Creek floodplain (This site is located along a small tributary to Beaucoup Creek.). They consist of very deep soils formed in silty alluvium. The Hoyleton series consists of deep soils on low convex ridges in uplands.

Soil cores were examined from representative locations at each vegetation area at the site. Redoximorphic features are present in the soil profiles for Areas 2-5 (vegetation areas in Table 2 above). The site hydrology and morphological characteristics of these soils suggest that they are saturated long enough for anaerobic conditions to occur in the upper profile for a significant duration. Therefore, these soils are hydric. Redoximorphic features are not present in the soil profiles for Areas 1 and 6.

c) Presence of wetland hydrology

Field evidence of wetland hydrology included drift lines, water-borne sediment deposits, and low landscape position. Wetland hydrology on the site derives from local flooding, but could be affected by floods on Beaucoup Creek from time to time. Four separate areas on the entire site met the wetland hydrology criteria, based on our observations. These include the "pond" drainageway (Site 2), much of the open area in the floodplain forest restoration (Site 3), and two low areas within the existing floodplain forest (Sites 4 and 5).

ISGS personnel installed instruments to help determine the extent of wetland hydrology, but they were only in place for part of 2002, thus could not show how much of the site had conclusive wetland hydrology (Pociask and Lake 2002). However, two of the wells established (3S and 4S) (Appendix 2) satisfied wetland criteria between May and September 2002.

In 2003, ISGS measurements suggested that 2.6 ha (6.4 acres) of the 6.7 ha (16.4 acre) site meets the wetland hydrology criterion (Pociask and Lake 2003). The area mapped by the ISGS (Appendix 2) includes all the sites considered wetland in this report, as well as part of the existing floodplain forest not considered wetland.

Project Goal 2

a) Survival of planted species

Table 4 presents data for planted tree survival, with numbers of observed live stems. According to the memo regarding the site, 25 individuals of five different species were to be planted. (Individuals of *Quercus palustris* and *Q. shumardii* are considered together, for the best way to distinguish the two species is by their acorns, and the saplings are too young to bear fruit.)

Table 4. Observed survival of planted trees in 2002 and 2003 at the Pyatts wetland mitigation site.

Species	Live stems Observed 2002	2003	Survival since planting (%)
Carya illinoensis	26	23	92
Liquidambar styraciflua	25	19	76
Quercus bicolor	11	6	24
Quercus palustris/shumardii	38	33	66
Total	100	81	64.8

It is notable that pecans and sweetgums planted on the site appeared to fare better than the oaks. Perhaps a few of the apparently dead ones will resprout; but in any case, overall survival of planted trees does not meet the performance standard. Thus, more oaks may need to be planted.

As part of the goal of restoring floodplain forest on part of the mitigation site, shrubs of three species were planted. Nowhere near the 100 of each species proposed for planting were found, though some may have been overlooked in the thick herbaceous cover in the open part of the area. (Some were also located in an adjacent part of the existing floodplain forest.) We observed 31 individuals of *Ilex decidua*, 14 of *Itea virginica*, and 28 of *Lindera benzoin*. This compares with 40, 20, and 5, respectively, in 2002. Perhaps many of the spicebush plantings were overlooked or thought dead in 2002.

Three hundred individuals each of four species (*Acorus calamus, Pontedaria cordata, Sagittaria latifolia,* and *Saururus cernuus*) were proposed for planting in the "pond" area (memo from Scott Marlow 2002). None were observed in 2002 (Tessene *et al.* 2003) or 2003 (this report), but the memo stated that the species were to be planted after a stable water level was established at the pond.

b) Dominant plant species

Most of the dominant plant species on the wetland creation/restoration site are native species. One notable exception is *Festuca pratensis* in the prairie planting. This aggressive turf grass may have spread from the nearby roadside planting when the site was established, or it may have been inadvertently introduced in the seed mix for the site. In any case, it should be controlled, perhaps by a combination of controlled burns and herbicide, because it tends to suppress other species growing with it. Two non-native shrubs, *Elaeagnus umbellata* and *Rosa multiflora*, were also found on this site. Their numbers are still low, and they should be easily removed through the use of controlled burns, cutting, and herbicide. In the case of controlled burns, an effort should be made to protect the tree plantings from fire effects.

The small area of prairie planting north of the existing floodplain forest is dominated by the annual weedy non-native grass *Setaria.* If this site was seeded at the same time as the rest of the prairie planting, perennial species should develop in the next year or two, and come to dominate.

The prairie planting area contained no hydrophytic vegetation in its dominants. This may be in part due to a large proportion of non-wetland species in the seed mix. Also, this area is at a relatively higher elevation than the rest of the site.

Lonicera japonica is locally common in higher areas in the existing floodplain forest. If control measures are used against the other aggressive non-natives listed above, this would be another good candidate.

Recommendations

The pond proposed for the site was still not constructed. If this remains a project goal, constructing the berm is necessary in order to establish wetland conditions for the pond and sedge meadow areas (other than along the existing drainageway, where wetland conditions do exist).

In order to achieve the desired 80% survival (over five years) of planted trees called for in the initial mitigation site plan, more oaks will need to be installed, for their survival already does not meet project goals. The pecans and sweetgums planted survived at acceptable rates.

The prairie planting area meets none of the three wetland criteria. Without excavation of this area, it will never be wetland. However, the main prairie planting has a good cover of perennial species, and serves as a buffer for the rest of the site. The dominant, aggressive, non-native grass *Festuca pratensis* should be controlled in the interests of increasing plant species diversity. This could be done by using herbicide during the dormant season, because fescue remains evergreen while most native species are dormant by late fall.

Only parts of the existing floodplain forest meet all three wetland criteria. However, this plant community serves as an important buffer for the small stream running through the site.

During the next annual survey of the site, we plan to use GPS to try to reconcile the differences in the size of the site given in the original request for survey and in the ISGS hydrology report. Also, we can calculate areas for each vegetation type and how much of each is wetland.

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Appendix 1
ROUTINE ONSITE WETLAND DETERMINATION
Site 1 (page 1 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Prairie (native grassland)
Legal Description: SW/4, SW/4, SW/4, Sec. 7 and NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Prairie planting area, mainly in the southwest part of the creation/restoration site

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. *Festuca pratensis*	FACU-	herb
2. *Ratibida pinnata*	UPL	herb
3. *Sorghastrum nutans*	FACU+	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 0%
Hydrophytic vegetation: Yes: No: X
Rationale: Fewer than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS
Series and phase: Hoyleton silt loam (Aquertic Hapludalfs)
On Perry County hydric soils list? Yes: No: X
Is the soil a histosol? Yes: No: X Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: No: X Color: N/A
Redox Depletions? Yes: No: X Color: N/A
Matrix color: 10YR 5/4
Other hydric soil indicators: None
Hydric soils: Yes: No: X
Rationale: The Natural Resources Conservation Service classifies Hoyleton as having somewhat poorly drained and slowly permeable soils. The lack of redoximorphic features and other hydric soil indicators is evidence that this soil is not saturated for a significant period of the growing season. Therefore the soil is not hydric.

HYDROLOGY
Inundated: Yes: No: X Depth of standing water: None
Depth to saturated soil: More than 1.2 m (48 in)
Overview of hydrologic flow through system: Precipitation and sheet flow contribute water to this site. Water leaves the site by evapotranspiration and sheet flow.
Size of watershed: Less than 2.6 km^2 (1.0 mi^2)
Other field evidence observed: None
Wetland hydrology: Yes: No: X
Rationale: This site is at the highest relative elevation in the project area. The lack of indicators of wetland hydrology suggest that the site is not inundated or saturated long enough during the growing season to meet the wetland hydrology criterion.

ROUTINE ONSITE WETLAND DETERMINATION

Site 1 (page 2 of 3)

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Location: Prairie planting area, mainly in the southwest part of the creation/restoration site

WETLAND DETERMINATION AND RATIONALE

Is the site a wetland? Yes: No: X

Rationale: This site meets none of the three wetland criteria. The site is not included in the NWI.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland Indicator	C*
Acalypha virginica	three-seeded mercury	herb	FACU	2
Agrostis alba	redtop	herb	FACW	0
Ambrosia artemisiifolia	common ragweed	herb	FACU	0
Ambrosia trifida	giant ragweed	herb	FAC+	0
Andropogon gerardii	big bluestem	herb	FAC-	5
Andropogon virginicus	broomsedge	herb	FAC-	1
Apocynum cannabinum	dogbane	herb	FAC	2
Asclepias syriaca	common milkweed	herb	UPL	0
Aster novae-angliae	New England aster	herb	FACW	4
Aster pilosus	field aster	herb	FACU+	0
Aster vimineus	small white aster	herb	FACW-	3
Boltonia asteroides	false aster	herb	FACW	5
Cardiospermum halicabamum	balloon vine	herb	FAC	**
Carex annectens	sedge	herb	FACW	3
Conyza canadensis	horseweed	herb	FAC-	0
Cornus drummondii	rough-leaved dogwood	shrub	FAC	2
Dactylis glomerata	orchard grass	herb	FACU	**
Daucus carota	Queen Anne's lace	herb	UPL	**
Digitaria ischaemum	smooth crabgrass	herb	FACU	**
Diodia teres	buttonweed	herb	UPL	2
Elaeagnus umbellata	autumn olive	shrub	UPL	**
Eragrostis spectabilis	purple love grass	herb	UPL	3
Erigeron annuus	daisy fleabane	herb	FAC-	1
Eupatorium serotinum	late boneset	herb	FAC+	1
Festuca pratensis	tall fescue	herb	FACU-	**
Fraxinus pennsylvanica	green ash	shrub	FACW	2
Juniperus virginiana	red cedar	shrub	UPL	1
Lactuca biennis	biennial lettuce	herb	FAC	4
Lactuca saligna	willow lettuce	herb	FACU	**
Lonicera maackii	Amur honeysuckle	shrub	UPL	**
Lotus corniculatus	birdsfoot trefoil	herb	FAC-	**
Melilotus alba	white sweet clover	herb	FACU	**
Oenothera biennis	evening primrose	herb	FACU	1
Oxalis dillenii	yellow wood-sorrel	herb	FACU	0

* Coefficient of Conservatism (see introduction)

** Species not native to Illinois

(Species list concludes on next page)

ROUTINE ONSITE WETLAND DETERMINATION

Site 1 (page 3 of 3)

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Location: Prairie planting area, mainly in the southwest part of the creation/restoration site

SPECIES LIST (concluded)

Scientific name	Common name	Stratum	Wetland Indicator	C*
Panicum implicatum	old field panic grass	herb	FAC	2
Panicum virgatum	switch grass	herb	FAC+	4
Physalis subglabrata	smooth ground-cherry	herb	UPL	0
Plantago lanceolata	buckhorn plantain	herb	FAC	**
Polygala sanguinea	field milkwort	herb	FACU	5
Prunus serotina	black cherry	shrub	FACU	1
Pyrrhopappus carolinianus	false dandelion	herb	UPL	1
Ratibida pinnata	yellow coneflower	herb	UPL	4
Rosa multiflora	multiflora rose	shrub	FACU	**
Rosa setigera	Illinois rose	shrub	FACU+	5
Rubus allegheniensis	wild blackberry	shrub	FACU+	2
Rudbeckia hirta	black-eyed Susan	herb	FACU	2
Rumex altissimus	pale dock	herb	FACW-	2
Rumex crispus	curly dock	herb	FAC+	**
Setaria faberi	giant foxtail	herb	FACU+	**
Setaria glauca	yellow foxtail	herb	FAC	**
Solanum caroliniense	horse nettle	herb	FACU-	0
Solidago canadensis	Canada goldenrod	herb	FACU	1
Sorghastrum nutans	Indian grass	herb	FACU+	4
Taraxacum officinale	dandelion	herb	FACU	**
Teucrium canadense	American germander	herb	FACW-	3
Tridens flavus	purpletop	herb	UPL	1
Trifolium pratense	red clover	herb	FACU+	**
Trifolium repens	white clover	herb	FACU+	**
Xanthium strumarium	cocklebur	herb	FAC	0

* Coefficient of Conservatism (see introduction) ** Species not native to Illinois

Mean c value = $\sum C/N = 79/41 = 1.9$ FQI = $\bar{c}\sqrt{N} = \sum C/\sqrt{N} = 79/\sqrt{41} = 12.3$

Determined by: Paul Tessene, and Paul Marcum (vegetation and hydrology)
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ROUTINE ONSITE WETLAND DETERMINATION

Site 2 (page 1 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Marsh
Legal Description: SW/4, SW/4, SW/4, Sec. 7, T.6S., R.2W.
Location: Along a drainageway extending from the road to the existing floodplain forest

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. *Juncus effusus*	OBL	herb
2. *Leersia oryzoides*	OBL	herb
3. *Scirpus atrovirens*	OBL	herb
4. *Typha angustifolia*	OBL	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Bonnie silt loam (Typic Fluvaquent)
On Perry County hydric soils list? Yes: X No:
Is the soil a histosol? Yes: No: X Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: X No: Colors: 7.5YR 3/3, 7.5YR 4/4 & 7.5YR 5/6
Redox Depletions? Yes: No: X Color: N/A
Matrix color: 10YR 4/1
Other hydric soil indicators: None

Hydric soils: Yes: X No:
Rationale: The Natural Resources Conservation Service classifies Bonnie as having poorly drained conditions. The presence of redoximorphic features and a low chroma matrix are evidence of an environment saturated at a duration sufficient to promote extended periods of anaerobic conditions. Therefore, the soil meets the hydric soil criterion. This soil also meets the F3 hydric soil indicator from the NRCS.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: None
Depth to saturated soil: More than 0.9 m (36 in)
Overview of hydrologic flow through system: Precipitation and sheet flow contribute water to this site. Flooding on Beaucoup Creek can sometimes reach the site, or at least affect water tables. Water leaves the site by evapotranspiration and sheet flow.
Size of watershed: Approximately 647.5 km^2 (250 mi^2) for Beaucoup Creek
Other field evidence observed: This site is located along a drainageway. We observed drift lines, water-borne sediment deposits, and some bare areas that suggest prolonged ponding.

Wetland hydrology: Yes: X No:
Rationale: Landscape position and the evidence of prolonged ponding suggest that the site is inundated or saturated long enough during the growing season to meet the wetland hydrology criterion. This area is included in the area that meets the criterion from ISGS estimates as well.

ROUTINE ONSITE WETLAND DETERMINATION

Site 2 (page 2 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Marsh
Legal Description: SW/4, SW/4, SW/4, Sec. 7, T.6S., R.2W.
Location: Along a drainageway extending from the road to the existing floodplain forest

WETLAND DETERMINATION AND RATIONALE

Is the site a wetland? Yes: X No:
Rationale: This site meets all three wetland criteria. The site is not included in the NWI.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland Indicator	C*
Acer saccharinum	silver maple	shrub	FACW	1
Agrostis alba	redtop	herb	FACW	0
Ambrosia trifida	giant ragweed	herb	FAC+	0
Ammania coccinea	scarlet loosestrife	herb	OBL	5
Apocynum cannabinum	dogbane	herb	FAC	2
Asclepias syriaca	common milkweed	herb	UPL	0
Aster ontarionis	Ontario aster	herb	FAC	4
Aster vimineus	small white aster	herb	FACW-	3
Boehmeria cylindrica	false nettle	herb	OBL	3
Bidens aristosa	swamp marigold	herb	FACW	1
Boehmeria cylindrica	false nettle	herb	OBL	3
Cardiospermum halicabamum	balloon vine	herb	FAC	**
Carex annectens	sedge	herb	FACW	3
Carex aureolensis	sedge	herb	OBL	4
Carex lupulina	hop sedge	herb	OBL	5
Carex normalis	sedge	herb	FACW	4
Carex tribuloides	sedge	herb	FACW+	3
Carex vulpinoidea	fox sedge	herb	OBL	3
Cicuta maculata	water hemlock	herb	OBL	4
Cyperus strigosus	straw nutsedge	herb	FACW	0
Echinochloa muricata	barnyard grass	herb	OBL	0
Eleocharis acicularis	spike rush	herb	OBL	3
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Festuca pratensis	tall fescue	herb	FACU-	**
Fraxinus pennsylvanica	green ash	shrub, herb	FACW	2
Helenium autumnale	sneezeweed	herb	FACW+	3
Hibiscus lasiocarpus	woolly rose-mallow	herb	OBL	5
Impatiens capensis	orange jewelweed	herb	FACW	2
Iris shrevei	blue flag iris	herb	OBL	5
Juncus diffusissimus	slim-pod rush	herb	FACW	7
Juncus effusus	soft rush	herb	OBL	4
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lobelia siphilitica	great blue lobelia	herb	FACW+	4
Lotus corniculatus	birdsfoot trefoil	herb	FAC-	**

* Coefficient of Conservatism (see introduction)
** Species not native to Illinois

(Species list concludes on next page)

ROUTINE ONSITE WETLAND DETERMINATION

Site 2 (page 3 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Marsh
Legal Description: SW/4, SW/4, SW/4, Sec. 7, T.6S., R.2W.
Location: Along a drainageway extending from the road to the existing floodplain forest

SPECIES LIST (concluded)

Scientific name	Common name	Stratum	Wetland Indicator	C*
Ludwigia palustris	marsh purslane	herb	OBL	4
Lycopus americanus	bugleweed	herb	OBL	3
Lycopus virginicus	Virginia bugleweed	herb	OBL	5
Morus alba	white mulberry	sapling, shrub	FAC	**
Panicum rigidulum	Munro grass	herb	FACW	6
Panicum virgatum	switch grass	herb	FAC+	4
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phalaris arundinacea	reed canary grass	herb	FACW+	**
Polygonum punctatum	dotted smartweed	herb	OBL	3
Prunella vulgaris	self-heal	herb	FAC	1
Pyrrhopappus carolinianus	false dandelion	herb	UPL	1
Rubus allegheniensis	wild blackberry	shrub	FACU+	2
Rumex altissimus	pale dock	herb	FACW-	2
Rumex crispus	curly dock	herb	FAC+	**
Salix nigra	black willow	shrub, herb	OBL	3
Scirpus atrovirens	green bulrush	herb	OBL	4
Setaria faberi	giant foxtail	herb	FACU+	**
Setaria glauca	yellow foxtail	herb	FAC	**
Solidago canadensis	Canada goldenrod	herb	FACU	1
Sorghastrum nutans	Indian grass	herb	FACU+	4
Toxicodendron radicans	poison ivy	herb	FAC+	1
Trifolium hybridum	alsike clover	herb	FAC-	**
Typha angustifolia	narrowleaf cattail	herb	OBL	**
Typha latifolia	common cattail	herb	OBL	1
Ulmus americana	American elm	shrub	FACW-	5
Verbena hastata	blue vervain	herb	FACW+	3
Xanthium strumarium	cocklebur	herb	FAC	0

* Coefficient of Conservatism (see introduction)
Mean c value = $\Sigma C/N = 145/51 = 2.8$

** Species not native to Illinois
$FQI = \bar{C}\sqrt{N} = \Sigma C/\sqrt{N} = 145/\sqrt{51} = 20.3$

Determined by: Paul Tessene, and Paul Marcum (vegetation and hydrology)
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ROUTINE ONSITE WETLAND DETERMINATION

Site 3 (page 1 of 5)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Wet meadow (floodplain forest restoration)
Legal Description: NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Low, open area in southeastern part of site with planted trees; between the road and the existing floodplain forest

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. *Agrostis alba*	FACW	herb
2. *Boltonia asteroides*	FACW	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%
Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Bonnie silt loam (Typic Fluvaquent)
On Perry County hydric soils list? Yes: X No:
Is the soil a histosol? Yes: No: X Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: X No: Colors: 7.5YR 4/6, 7.5YR 6/8 & 2.5YR 3/4
Redox Depletions? Yes: No: X Color: N/A
Matrix color: 10YR 4/2
Other hydric soil indicators: None
Hydric soils: Yes: X No:
Rationale: The Natural Resources Conservation Service classifies Bonnie as having poorly drained conditions. The presence of redoximorphic features and a low chroma matrix are evidence of an environment saturated for a duration sufficient to promote extended periods of anaerobic conditions. Therefore, the soil meets the hydric soil criterion. The NRCS hydric soil indicator F3 is also met by this soil.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: None
Depth to saturated soil: More than 0.9 m (36 in)
Overview of hydrologic flow through system: Precipitation and sheet flow contribute water to this site. Flooding on Beaucoup Creek can sometimes reach the site, or at least affect water tables. Water leaves the site by evapotranspiration and sheet flow.
Size of watershed: Approximately 647.5 km^2 (250 mi^2) for Beaucoup Creek
Other field evidence observed: This site is located in a low area. We observed drift lines and wetland drainage patterns.
Wetland hydrology: Yes: X No:
Rationale: Landscape position and the evidence of flooding suggest that the site is inundated or saturated long enough during the growing season to meet the wetland hydrology criterion. This area is included in the area that meets the criterion from ISGS estimates as well.

ROUTINE ONSITE WETLAND DETERMINATION

Site 3 (page 2 of 5)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Wet meadow (floodplain forest restoration)
Legal Description: NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Low, open area in southeastern part of site with planted trees; between the road and the existing floodplain forest

WETLAND DETERMINATION AND RATIONALE

Is the site a wetland? Yes: X No:
Rationale: This site meets all three wetland criteria. The site is not included in the NWI.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland Indicator	C*
Acalypha rhomboidea	three-seeded mercury	herb	FACU	0
Acer saccharinum	silver maple	shrub, herb	FACW	1
Agrostis alba	redtop	herb	FACW	0
Allium vineale	field garlic	herb	FACU	**
Amaranthus tuberculatus	water hemp	herb	OBL	1
Ambrosia artemisiifolia	common ragweed	herb	FACU	0
Ambrosia trifida	giant ragweed	herb	FAC+	0
Andropogon virginicus	broomsedge	herb	FAC-	1
Apocynum cannabinum	dogbane	herb	FAC	2
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster ontarionis	Ontario aster	herb	FAC	4
Aster pilosus	field aster	herb	FACU+	0
Aster vimineus	small white aster	herb	FACW-	3
Barbarea vulgaris	winter cress	herb	FAC	**
Bidens aristosa	swamp marigold	herb	FACW	1
Boehmeria cylindrica	false nettle	herb	OBL	3
Boltonia asteroides	false aster	herb	FACW	5
Bromus japonicus	Japanese brome	herb	FACU	**
Cardiospermum halicabamum	balloon vine	herb	FAC	**
Carduus nutans	nodding thistle	herb	UPL	**
Carex annectens	sedge	herb	FACW	3
Carex aureolensis	sedge	herb	OBL	4
Carex conjuncta	sedge	herb	FACW	5
Carex cristatella	sedge	herb	FACW+	3
Carex frankii	sedge	herb	OBL	4
Carex normalis	sedge	herb	FACW	4
Carex tribuloides	sedge	herb	FACW+	3
Carex vulpinoidea	fox sedge	herb	OBL	3
Cicuta maculata	water hemlock	herb	OBL	4
Conyza canadensis	horseweed	herb	FAC-	0
Cornus drummondii	rough-leaved dogwood	shrub	FAC	2
Cyperus erythrorhizos	red-rooted sedge	herb	OBL	1
Cyperus esculentus	yellow nutsedge	herb	FACW	0
Cyperus strigosus	straw nutsedge	herb	FACW	0

* Coefficient of Conservatism (see introduction)
** Species not native to Illinois
(Species list continues on next page)

ROUTINE ONSITE WETLAND DETERMINATION

Site 3 (page 3 of 5)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Wet meadow (floodplain forest restoration)
Legal Description: NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Low, open area in southeastern part of site with planted trees; between the road and the existing floodplain forest

SPECIES LIST (continued)

Scientific name	Common name	Stratum	Wetland Indicator	C*
Daucus carota	Queen Anne's lace	herb	UPL	**
Desmodium paniculatum	panicled tick trefoil	herb	FACU	2
Digitaria ischaemum	smooth crabgrass	herb	FACU	**
Echinochloa muricata	barnyard grass	herb	OBL	0
Eclipta prostrata	yerba de tajo	herb	FACW	2
Elaeagnus umbellata	autumn olive	shrub	UPL	**
Eleocharis obtusa	spike rush	herb	OBL	2
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Erigeron annuus	daisy fleabane	herb	FAC-	1
Erigeron philadelphicus	marsh fleabane	herb	FACW	3
Eupatorium perfoliatum	boneset	herb	FACW+	4
Eupatorium serotinum	late boneset	herb	FAC+	1
Euthamia graminifolia	grass-leaved goldenrod	herb	FACW-	3
Festuca pratensis	tall fescue	herb	FACU-	**
Fraxinus pennsylvanica	green ash	tree, sapling, shrub	FACW	2
Geum canadense	white avens	herb	FAC	2
Hibiscus lasiocarpus	woolly rose-mallow	herb	OBL	5
Hordeum pusillum	little barley	herb	FAC	0
Hypericum punctatum	spotted St. Johnswort	herb	FAC+	3
Ipomoea lacunosa	small morning glory	herb	FACW	1
Juncus biflorus	rush	herb	FACW	5
Juncus effusus	soft rush	herb	OBL	4
Juncus tenuis	path rush	herb	FAC	0
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lonicera japonica	Japanese honeysuckle	woody vine	FACU	**
Ludwigia alternifolia	seedbox	herb	OBL	5
Ludwigia polycarpa	false loosestrife	herb	OBL	5
Lycopus americanus	bugleweed	herb	OBL	3
Lycopus virginicus	Virginia bugleweed	herb	OBL	5
Lythrum alatum	winged loosestrife	herb	OBL	5
Mimulus alatus	monkey flower	herb	OBL	6
Oenothera biennis	evening primrose	herb	FACU	1
Oxalis dillenii	yellow wood-sorrel	herb	FACU	0
Panicum clandestinum	deer-tongue grass	herb	FACW	4
Panicum dichotomiflorum	fall panic grass	herb	FACW-	0
Panicum rigidulum	Munro grass	herb	FACW	6
Paspalum floridanum	giant bead grass	herb	FACW	7
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phalaris arundinacea	reed canary grass	herb	FACW+	**

* Coefficient of Conservatism (see introduction)
** Species not native to Illinois

(Species list concludes on next page)

ROUTINE ONSITE WETLAND DETERMINATION

Site 3 (page 4 of 5)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Wet meadow (floodplain forest restoration)
Legal Description: NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Low, open area in southeastern part of site with planted trees; between the road and the existing floodplain forest

SPECIES LIST (concluded)

Scientific name	Common name	Stratum	Wetland Indicator	C*
Phyla lanceolata	fog-fruit	herb	OBL	1
Plantago lanceolata	buckhorn plantain	herb	FAC	**
Plantago rugelii	Rugel's plantain	herb	FAC+	0
Pluchea camphorata	camphor weed	herb	FACW	7
Polygonum lapathifolium	nodding smartweed	herb	FACW+	0
Polygonum persicaria	lady's-thumb	herb	FACW	**
Polygonum punctatum	dotted smartweed	herb	OBL	3
Populus deltoides	cottonwood	shrub, herb	FAC+	2
Potentilla norvegica	rough cinquefoil	herb	FAC	0
Pyrrhopappus carolinianus	false dandelion	herb	UPL	1
Ratibida pinnata	yellow coneflower	herb	UPL	4
Rubus allegheniensis	wild blackberry	shrub	FACU+	2
Rumex altissimus	pale dock	herb	FACW-	2
Rumex crispus	curly dock	herb	FAC+	**
Rumex verticillatus	swamp dock	herb	OBL	5
Salix nigra	black willow	shrub, herb	OBL	3
Sambucus canadensis	elderberry	shrub	FACW-	2
Scirpus atrovirens	green bulrush	herb	OBL	4
Setaria glauca	yellow foxtail	herb	FAC	**
Sida spinosa	prickly mallow	herb	FACU	**
Sorghastrum nutans	Indian grass	herb	FACU+	4
Toxicodendron radicans	poison ivy	herb	FAC+	1
Typha latifolia	common cattail	herb	OBL	1
Ulmus americana	American elm	shrub	FACW-	5
Verbena hastata	blue vervain	herb	FACW+	3
Vernonia gigantea	ironweed	herb	FAC	4
Xanthium strumarium	cocklebur	herb	FAC	0

* Coefficient of Conservatism (see introduction) ** Species not native to Illinois

Mean c value = $\Sigma C/N = 211/84 = 2.5$ $FQI = \bar{c}\sqrt{N} = \Sigma C/\sqrt{N} = 211/\sqrt{84} = 23.0$

Including planted woody species:

Carya illinoensis	pecan	sapling	FACW	6
Ilex decidua	deciduous holly	shrub	FACW	6
Itea virginica	Virginia sweetspire	shrub	OBL	10
Liquidambar styraciflua	sweet gum	sapling	FACW	6
Quercus bicolor	swamp white oak	sapling	FACW+	7
Quercus palustris	pin oak	sapling	FACW	4
Quercus shumardii	Shumard oak	sapling	FACW-	7

Mean c value = $\Sigma C/N = 257/91 = 2.8$ $FQI = \bar{c}\sqrt{N} = \Sigma C/\sqrt{N} = 257/\sqrt{91} = 26.9$

ROUTINE ONSITE WETLAND DETERMINATION

Site 3 (page 5 of 5)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Wet meadow (floodplain forest restoration)
Legal Description: NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Low, open area in southeastern part of site with planted trees; between the road and the existing floodplain forest

Determined by: Paul Tessene, and Paul Marcum (vegetation and hydrology)
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ROUTINE ONSITE WETLAND DETERMINATION

Site 4 (page 1 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7, T.6S., R.2W.
Location: Low area near the south end of the existing floodplain forest

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. *Quercus palustris*	FACW	tree
2. *Ulmus americana*	FACW-	tree
3. *Cinna arundinacea*	FACW	herb
4. *Elymus virginicus*	FACW-	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Bonnie silt loam (Typic Fluvaquent)
On Perry County hydric soils list? Yes: X No:
Is the soil a histosol? Yes: No: X Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: X No: Colors: 10YR 4/6 & 7.5YR 5/8
Redox Depletions? Yes: No: X Color: N/A
Matrix color: 10YR 4/2
Other hydric soil indicators: None

Hydric soils: Yes: X No:
Rationale: The Natural Resources Conservation Service classifies Bonnie as having poorly drained conditions. The presence of redoximorphic features and a low chroma matrix are evidence of an environment saturated at a duration sufficient to promote extended periods of anaerobic conditions. Therefore, the soil meets the hydric soil criterion. The F3 hydric soil indicator from the NRCS is also met.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: None
Depth to saturated soil: More than 0.9 m (36 in)
Overview of hydrologic flow through system: Precipitation, sheet flow, and flooding on an intermittent stream contribute water to this site. Flooding on Beaucoup Creek can sometimes reach the site, or at least affect water tables. Water leaves the site by evapotranspiration.
Size of watershed: Approximately 647.5 km^2 (250 mi^2) for Beaucoup Creek
Other field evidence observed: This site is located in a low area along a small stream. We observed drift lines, water-borne sediment deposits, wetland drainage patterns, and bare areas that suggest prolonged ponding.

Wetland hydrology: Yes: X No:
Rationale: Landscape position and the evidence of flooding suggest that the site is inundated or saturated long enough during the growing season to meet the wetland hydrology criterion. This area is included in the area that meets the criterion from ISGS estimates as well.

ROUTINE ONSITE WETLAND DETERMINATION

Site 4 (page 2 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7, T.6S., R.2W.
Location: Low area near the south end of the existing floodplain forest

WETLAND DETERMINATION AND RATIONALE

Is the site a wetland? Yes: X No:
Rationale: This site meets all three wetland criteria. The site is not included in the NWI.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland Indicator	C*
Acer saccharinum	silver maple	tree, sapling	FACW	1
Aster lateriflorus	calico aster	herb	FACW-	2
Boehmeria cylindrica	false nettle	herb	OBL	3
Carex grayi	bur sedge	herb	FACW+	6
Carex muskingumensis	sedge	herb	OBL	6
Carex radiata	sedge	herb	UPL	5
Carex squarrosa	sedge	herb	OBL	5
Carex tribuloides	sedge	herb	FACW+	3
Celtis occidentalis	hackberry	sapling, shrub	FAC-	3
Cinna arundinacea	tall wood reed	herb	FACW	5
Diospyros virginiana	persimmon	tree, sapling	FAC	2
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Eupatorium rugosum	white snakeroot	herb	FACU	2
Fraxinus pennsylvanica	green ash	tree	FACW	2
Geum canadense	white avens	herb	FAC	2
Glyceria striata	fowl manna grass	herb	OBL	4
Hypericum punctatum	spotted St. Johnswort	herb	FAC+	3
Ilex decidua	deciduous holly	shrub	FACW	6
Leersia virginica	white grass	herb	FACW	4
Lobelia cardinalis	cardinal flower	herb	OBL	6
Lobelia siphilitica	great blue lobelia	herb	FACW+	4
Lonicera maackii	Amur honeysuckle	shrub	UPL	**
Lycopus virginicus	Virginia bugleweed	herb	OBL	5
Panicum clandestinum	deer-tongue grass	herb	FACW	4
Parthenocissus quinquefolia	Virginia creeper	woody vine	FAC-	2
Pilea pumila	clearweed	herb	FACW	3
Polygonum punctatum	dotted smartweed	herb	OBL	3
Prunella vulgaris	self-heal	herb	FAC	1
Quercus imbricaria	shingle oak	tree, sapling	FAC-	2
Quercus palustris	pin oak	tree, sapling, shrub	FACW	4
Ranunculus septentrionalis	swamp buttercup	herb	FACW+	4

* Coefficient of Conservatism (see introduction)

** Species not native to Illinois

(Species list concludes on next page)

ROUTINE ONSITE WETLAND DETERMINATION

Site 4 (page 3 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7, T.6S., R.2W.
Location: Low area near the south end of the existing floodplain forest

SPECIES LIST (concluded)

Scientific name	Common name	Stratum	Wetland Indicator	C*
Scirpus atrovirens	green bulrush	herb	OBL	4
Solanum caroliniense	horse nettle	herb	FACU-	0
Symphoricarpos orbiculatus	buckbrush	shrub	FACU	1
Toxicodendron radicans	poison ivy	woody vine, herb	FAC+	1
Ulmus americana	American elm	tree, sapling, shrub	FACW-	5
Viola missouriensis	Missouri violet	herb	FACW	4
Viola pratincola	common blue violet	herb	FAC	1

* Coefficient of Conservatism (see introduction)
Mean c value = $\sum C/N = 125/37 = 3.4$

** Species not native to Illinois
$FQI = \overline{C}\sqrt{N} = \sum C/\sqrt{N} = 125/\sqrt{37} = 20.5$

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ROUTINE ONSITE WETLAND DETERMINATION

Site 5 (page 1 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7, T.6S., R.2W.
Location: Southwestern part of the existing floodplain forest, directly east of IL 13/127

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. *Acer saccharinum*	FACW	tree
2. *Platanus occidentalis*	FACW	tree
3. *Aster lateriflorus*	FACW-	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Bonnie silt loam (Typic Fluvaquent)
On Perry County hydric soils list? Yes: X No:
Is the soil a histosol? Yes: No: X Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: X No: Colors: 7.5YR 4/6 & 7.5YR 5/6
Redox Depletions? Yes: No: X Color: N/A
Matrix color: 10YR 4/2
Other hydric soil indicators: None

Hydric soils: Yes: X No:
Rationale: The Natural Resources Conservation Service classifies Bonnie as having poorly drained conditions. The presence of redoximorphic features and a low chroma matrix are evidence of an environment saturated at a duration sufficient to promote extended periods of anaerobic conditions. Therefore, the soil meets the hydric soil criterion. The F3 hydric soil indicator from the NRCS is also met.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: None
Depth to saturated soil: More than 0.9 m (36 in)
Overview of hydrologic flow through system: Precipitation, sheet flow, and flooding on an intermittent stream contribute water to this site. Flooding on Beaucoup Creek can sometimes reach the site, or at least affect water tables. Water leaves the site by evapotranspiration.
Size of watershed: Approximately 647.5 km^2 (250 mi^2) for Beaucoup Creek
Other field evidence observed: This site is located in a low area along a small stream. We observed drift lines, water-borne sediment deposits, wetland drainage patterns, watermarks on trees, and bare areas that suggest prolonged ponding.

Wetland hydrology: Yes: X No:
Rationale: Landscape position and the evidence of flooding suggest that the site is inundated or saturated long enough during the growing season to meet the wetland hydrology criterion. This area is included in the area that meets the criterion from ISGS estimates as well.

ROUTINE ONSITE WETLAND DETERMINATION

Site 5 (page 2 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7, T.6S., R.2W.
Location: Southwestern part of the existing floodplain forest, directly east of IL 13/127

WETLAND DETERMINATION AND RATIONALE

Is the site a wetland? Yes: X No:
Rationale: This site meets all three wetland criteria. The site is not included in the NWI.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland Indicator	C*
Acer negundo	box elder	sapling, shrub	FACW-	1
Acer saccharinum	silver maple	tree, sapling, shr., herb	FACW	1
Ambrosia trifida	giant ragweed	herb	FAC+	0
Aster lateriflorus	calico aster	herb	FACW-	2
Aster vimineus	small white aster	herb	FACW-	3
Boehmeria cylindrica	false nettle	herb	OBL	3
Carex annectens	sedge	herb	FACW	3
Carex aureolensis	sedge	herb	OBL	4
Carex blanda	sedge	herb	FAC	2
Carex grayi	bur sedge	herb	FACW+	6
Carex tribuloides	sedge	herb	FACW+	3
Celtis occidentalis	hackberry	sapling, shrub	FAC-	3
Cephalanthus occidentalis	buttonbush	shrub	OBL	4
Cinna arundinacea	tall wood reed	herb	FACW	5
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Eupatorium perfoliatum	boneset	herb	FACW+	4
Fraxinus pennsylvanica	green ash	tree, sapling	FACW	2
Geum canadense	white avens	herb	FAC	2
Ipomoea lacunosa	small morning glory	herb	FACW	1
Juncus effusus	soft rush	herb	OBL	4
Leersia oryzoides	rice cutgrass	herb	OBL	3
Leersia virginica	white grass	herb	FACW	4
Lonicera maackii	Amur honeysuckle	shrub	UPL	**
Morus alba	white mulberry	herb	FAC	**
Phragmites australis	common reed	herb	FACW+	1
Platanus occidentalis	sycamore	tree, sapling	FACW	3
Polygonum punctatum	dotted smartweed	herb	OBL	3
Populus deltoides	cottonwood	tree	FAC+	2
Quercus palustris	pin oak	sapling, shrub	FACW	4
Scirpus atrovirens	green bulrush	herb	OBL	4
Toxicodendron radicans	poison ivy	woody vine, herb	FAC+	1
Ulmus americana	American elm	tree, sapling	FACW-	5
Viola pratincola	common blue violet	herb	FAC	1

* Coefficient of Conservatism (see introduction)
Mean c value = $\Sigma C/N = 88/31 = 2.8$

** Species not native to Illinois
$FQI = \bar{c}\sqrt{N} = \Sigma C/\sqrt{N} = 88/\sqrt{31} = 15.8$

ROUTINE ONSITE WETLAND DETERMINATION

Site 5 (page 3 of 3)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7, T.6S., R.2W.
Location: Southwestern part of the existing floodplain forest, directly east of IL 13/127

Determined by: Paul Tessene, and Paul Marcum (vegetation and hydrology)
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ROUTINE ONSITE WETLAND DETERMINATION

Site 6 (page 1 of 4)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Mesic floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7 and NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Most of the existing floodplain forest north of Pyatts, directly east of IL 13/127

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. *Fraxinus pennsylvanica*	FACW	tree
2. *Ulmus americana*	FACW-	tree
3. *Lonicera japonica*	FACU	woody vine
4. *Viola pratincola*	FAC	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 75%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: NRCS mapped as Bonnie; revised to Belknap silt loam (Fluvaquentic Endoaquept)
On Perry County hydric soils list? Yes: No: X
Is the soil a histosol? Yes: No: X Histic epipedon present? Yes: No: X
Redox Concentrations? Yes: No: X Color: N/A
Redox Depletions? Yes: No: X Color: N/A
Matrix color: 10YR 4/2
Other hydric soil indicators: None

Hydric soils: Yes: No: X
Rationale: The Natural Resources Conservation Service classifies Belknap as having somewhat poorly drained conditions. The lack of redoximorphic features and other hydric soil indicators is evidence that this soil is not saturated for a significant period of the growing season. Therefore the soil is not hydric.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: None
Depth to saturated soil: More than 0.9 m (36 in)
Overview of hydrologic flow through system: Precipitation, sheet flow, and flooding on an intermittent stream contribute water to this site. Flooding on Beaucoup Creek can sometimes reach the site, or at least affect water tables. Water leaves the site by evapotranspiration.
Size of watershed: Approximately 647.5 km^2 (250 mi^2) for Beaucoup Creek
Other field evidence observed: This site is located along a small stream. We observed some drift lines.

Wetland hydrology: Yes: No: X
Rationale: This site is at a slightly higher elevation than Sites 4 and 5 and lacks enough evidence of flooding to suggest that the site is inundated or saturated long enough during the growing season to meet the wetland hydrology criterion.

ROUTINE ONSITE WETLAND DETERMINATION

Site 6 (page 2 of 4)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Mesic floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7 and NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Most of the existing floodplain forest north of Pyatts, directly east of IL 13/127

WETLAND DETERMINATION AND RATIONALE

Is the site a wetland? Yes: No: X

Rationale: Although dominant hydrophytic vegetation is present, hydric soils and wetland hydrology are absent. The site is not included in the NWI.

SPECIES LIST

Scientific name	Common name	Stratum	Wetland Indicator	C*
Acalypha rhomboidea	three-seeded mercury	herb	FACU	0
Acer negundo	box elder	tree, shrub	FACW-	1
Acer saccharinum	silver maple	tree, shrub	FACW	1
Allium vineale	field garlic	herb	FACU	**
Ambrosia trifida	giant ragweed	herb	FAC+	0
Aster lateriflorus	calico aster	herb	FACW-	2
Aster ontarionis	Ontario aster	herb	FAC	4
Boehmeria cylindrica	false nettle	herb	OBL	3
Carex conjuncta	sedge	herb	FACW	5
Carex grayi	bur sedge	herb	FACW+	6
Carex grisea	sedge	herb	UPL	3
Carex muskingumensis	sedge	herb	OBL	6
Carex radiata	sedge	herb	UPL	5
Carex tribuloides	sedge	herb	FACW+	3
Carya tomentosa	mockernut hickory	tree	UPL	6
Celtis occidentalis	hackberry	sapling, shrub	FAC-	3
Cephalanthus occidentalis	buttonbush	shrub	OBL	4
Cinna arundinacea	tall wood reed	herb	FACW	5
Cornus drummondii	rough-leaved dogwood	shrub	FAC	2
Cryptotaenia canadensis	honewort	herb	FAC	1
Diospyros virginiana	persimmon	tree, sapling, shrub	FAC	2
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Eupatorium rugosum	white snakeroot	herb	FACU	2
Festuca pratensis	tall fescue	herb	FACU-	**
Fraxinus pennsylvanica	green ash	tree, sapling, shrub	FACW	2
Geum canadense	white avens	herb	FAC	2
Gleditsia triacanthos	honey locust	tree, shrub	FAC	2
Glyceria striata	fowl manna grass	herb	OBL	4
Hibiscus lasiocarpus	woolly rose-mallow	herb	OBL	5
Hypericum punctatum	spotted St. Johnswort	herb	FAC+	3
Impatiens capensis	orange jewelweed	herb	FACW	2
Lactuca floridana	blue lettuce	herb	FAC-	4
Leersia virginica	white grass	herb	FACW	4
Lonicera japonica	Japanese honeysuckle	woody vine	FACU	**
Lonicera maackii	Amur honeysuckle	shrub	UPL	**
Lycopus virginicus	Virginia bugleweed	herb	OBL	5

* Coefficient of Conservatism (see introduction)

** Species not native to Illinois

(Species list concludes on next page)

ROUTINE ONSITE WETLAND DETERMINATION

Site 6 (page 3 of 4)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Mesic floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7 and NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Most of the existing floodplain forest north of Pyatts, directly east of IL 13/127

SPECIES LIST (concluded)

Scientific name	Common name	Stratum	Wetland Indicator	C*
Maclura pomifera	Osage orange	sapling, shrub	FACU	**
Morus alba	white mulberry	tree, shrub	FAC	**
Morus rubra	red mulberry	tree	FAC-	4
Oxalis dillenii	yellow wood-sorrel	herb	FACU	0
Panicum clandestinum	deer-tongue grass	herb	FACW	4
Parthenocissus quinquefolia	Virginia creeper	woody vine	FAC-	2
Phalaris arundinacea	reed canary grass	herb	FACW+	**
Physallis heterophylla	clammy ground cherry	herb	UPL	2
Phytolacca americana	pokeweed	herb	FAC-	1
Pilea pumila	clearweed	herb	FACW	3
Platanus occidentalis	sycamore	tree	FACW	3
Polygonum punctatum	dotted smartweed	herb	OBL	3
Polygonum scandens	climbing knotweed	herb	FAC	2
Podophyllum peltatum	mayapple	herb	FACU	4
Prunus serotina	black cherry	tree	FACU	1
Quercus imbricaria	shingle oak	tree, sapling	FAC-	2
Quercus palustris	pin oak	tree, sapling	FACW	4
Ranunculus abortivus	kidneyleaf buttercup	herb	FACW-	1
Rhus copallina	winged sumac	shrub	UPL	3
Rubus allegheniensis	wild blackberry	shrub	FACU+	2
Rubus flagellaris	creeping dewberry	herb	FACU-	2
Sambucus canadensis	elderberry	shrub	FACW-	2
Sanicula gregaria	black snakeroot	herb	FAC+	2
Sassafras albidum	sassafras	tree, shrub	FACU	2
Solanum caroliniense	horse nettle	herb	FACU-	0
Symphoricarpos orbiculatus	buckbrush	shrub	FACU	1
Toxicodendron radicans	poison ivy	woody vine, herb	FAC+	1
Ulmus americana	American elm	tree, sapling, shrub	FACW-	5
Viola missouriensis	Missouri violet	herb	FACW	4
Viola pratincola	common blue violet	herb	FAC	1

* Coefficient of Conservatism (see introduction) -- ** Species not native to Illinois
Mean c value = $\sum C/N = 162/59 = 2.7$ FQI = $\bar{c}\sqrt{N} = \sum C/\sqrt{N} = 162/\sqrt{59} = 21.1$

Including planted woody species:

Carya illinoensis	pecan	sapling	FACW	6
Ilex decidua	deciduous holly	shrub	FACW	6
Itea virginica	Virginia sweetspire	shrub	OBL	10
Lindera benzoin	spicebush	shrub	FACW-	5
Liquidambar styraciflua	sweet gum	sapling	FACW	6
Quercus bicolor	swamp white oak	sapling	FACW+	7

Mean c value = $\sum C/N = 202/65 = 3.1$ FQI = $\bar{c}\sqrt{N} = \sum C/\sqrt{N} = 202/\sqrt{65} = 25.1$

ROUTINE ONSITE WETLAND DETERMINATION

Site 6 (page 4 of 4)

Field Investigators: Tessene, Marcum, and Kurylo Date: 8 July 2003
Job No.: P99-102-90 Project Name: FAP 42 (IL 13/127) wetland mitigation site
State: Illinois County: Perry Applicant: IDOT District 9
Site name: Mesic floodplain forest
Legal Description: SW/4, SW/4, SW/4, Sec. 7 and NW/4, NW/4, NW/4, Sec. 18, T.6S., R.2W.
Location: Most of the existing floodplain forest north of Pyatts, directly east of IL 13/127

Determined by: Paul Tessene, and Paul Marcum (vegetation and hydrology)
Jesse Kurylo (soils and hydrology)
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Appendix 2

Estimated Aerial Extent of Wetland Hydrology for 2003

At the FAP 42 (IL 13/127) wetland creation/restoration site, near Pyatts, Perry County, Illinois